

ABSTRACT

Aim:

To evaluate the cortical and cancellous bone thickness in the mandibular buccal shelf region in class I and class III skeletal malocclusion subjects by bone mapping using cone beam computed tomography.

Materials and Methods:

CBCT images of twenty subjects were obtained for this in-vitro study from class I and class III skeletal malocclusion subjects, 10 from each group (5 low angle cases and 5 high angle cases). None of the subjects had noticeable periodontal disease or ectopically erupted teeth. All the reconstructed images were aligned in axial, sagittal and coronal planes. On the 3D reconstructed CBCT images, cortical and cancellous bone thickness measurements were made at the mesial, middle and distal aspects of the mandibular first and second molars. The cortical and cancellous bone thickness was measured perpendicular along the surface of the mandibular buccal shelf at 3 mm, 5 mm and 7 mm from the mean mandibular alveolar bone crest level at 5 progressive sites in the mandibular buccal shelf.

Results:

There was a statistically significant cortical and cancellous bone thickness ($p < 0.05$) in the second molar region in the low angle class I subjects at 3 and 5 mm level. Increased cortical bone thickness interdentally between first and second molar region and distal to second molar in low angle class III subjects. Class I low angle subjects had a statistically significant cortical bone thickness ($p < 0.05$) interdentally between first and second molar and at the second molar regions than the class III subjects.

Conclusion:

Mandibular buccal shelf is an absolute skeletal site for extra-alveolar bone screws to retract posterior dentition in conventional retraction cases and to perform an en masse distalization in conservative correction of mild-to-moderate skeletal class III malocclusion. The most ideal site for the TAD are the interdental region between the mandibular first and second molars, and the second molar region approximately at all 3 levels but best at the 5 mm to 7 mm level below the alveolar crest.

Key words:

SKELETAL CLASS III MALOCCLUSION, CORTICAL BONE, CANCELLOUS BONE, MANDIBULAR BUCCAL SHELF, TADS, DISTALIZATION.